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ABSTRACT

Nova University (Florida), offers off-campus undergraduate and graduate degree programs in education, business and public administration, psychology, and computer sciences. This paper describes one of these offerings, the Application of Technology to Education and Training (APTEC) specialization in the Ed.D. program in Child and Youth Studies (CYS). The APTEC program requires six courses in the specialization area and is designed to prepare the student as a child and youth advocate in the use of educational technology. Students in the CYS program meet twice a year for a 3- to 5-day period to interact with the instructor; this is followed by interaction through the audiobridge, videotapes and audiotapes, electronic mail, and the electronic classroom (an electronic forum on the Unix system). Four clusters of students are included in an ongoing evaluation that will encompass the 3-year span of the program and study its effectiveness. Results of the first evaluation year indicate that the program is successful. Appendix A contains a description of field-based programs by John Scigliano, and Appendix B describes the APTEC courses. (SLD)

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Distance Education: The Application of Technology to Education and Training (APTEC)

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INTRODUCTION:

Delivering graduate education at a distance from the home campus is more than simply getting information from the university to the student. It involves providing students stimulus materials and information in a variety of formats, obtaining reactions from students in a variety of ways, and providing instructor feedback to students through a variety of sources. Variety is the key to enriching the distance delivery system.

In addition to variety, unique means must be developed and used to enable students to communicate with each other and with the professor even though students and faculty are not in direct proximity to one another. The effectiveness of such a delivery and communication system is also important. What has been described, in other words, are the field-based programs in graduate education offered by Nova University.

BACKGROUND:

Nova University, is located in Fort Lauderdale, Florida, is a 4-year nonprofit, fully accredited, coeducational institution that was founded in 1964. As an acknowledged leader in distance education programs, Nova offers off-campus undergraduate and graduate degree programs in education, business and public administration, psychology, and computer sciences. Delivery networks include a variety of instructional modes, including field-based and electronic delivery.

Nova University's main campus is located on a 200-acre site. Nova's ''national campus'' extends throughout Florida at 76 sites in 28 cities, to 72 sites in 22 other states, and to four international locations. The Nova plan stresses the critical relationship between theory and practice; it reinforces and tests the classroom experience through applied research and community service as integral parts of the academic experience. Consistent with its mission, Nova University extends its resources to provide educational opportunities to working professionals nationwide, with faculty teaching at corporate sites and other locations across the country. Nova also delivers programs through a variety of educational technologies, including telecommunications. The University is committed to the idea that education should not be timebound or placebound and should use a variety of educational technologies.

Nova University accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS) since 1971 and received its 10-year reaffirmation of accreditation by SACS in 1985. In both instances, accreditation fully encompassed Nova's distance education programs. Nova is accredited to award

bachelor's, master's, educational specialist, and doctoral degrees. Nova University meets regulations that govern the provision of distance education programs by nonresident students in 30 states. The University is alma mater to more than 30,000 graduates of various programs who live in 50 states and a number of foreign countries. Included among its alumni are 27 college presidents and chancellors, 114 college vice-presidents and deans, a state commissioner of education, 9 superintendents of the nation's 47 largest school districts, 4 State of Florida Teachers of the Year, the chairperson of the Florida Education Standards Commission, judges, attorneys, a state legislator, corporate executives, entrepreneurs, and other leaders and officers of public and private organizations.

SPECIALIZATIONS:

Each degree program requires students to take a common core of courses for their general preparation in the field in which the doctorate is to be awarded. In addition, many of the programs offer students an opportunity to select an area of specialization where they can focus their work by taking courses in their fields of expertise.

The topic of this presentation is the educational technology specialization in the Ed.D. Program in Child and Youth Studies (CYS). The name of this specialization is Application of Technology to Education and Training (APTEC). It differs slightly from the other three CYS specializations in that students take six courses in their APTEC specialization; students in the other areas take only four specialization courses.

The APTEC specialization is designed to provide a depth and breadth of very specialized knowledge and skills to a unique group of technology specialists. This group includes educators, professionals involved in training, and those involved in managing information. These individuals do not need to be technicians; more than likely, technicians would be available on staff for these professionals. APTEC students are more appropriately considered technologists, because their role typically requires that they possess an awareness of a broad spectrum of applicable technology, and that they be responsible for imparting knowledge to others, and at times, be responsible for the management of technological resources.

RATIONALE FOR A SPECIALIZATION IN THE USE OF TECHNOLOGY

The technological tools available today encompass a vast array of hardware and software. This equipment is not static. Indeed, neither software nor hardware remains current for very long. Therefore, the workplace leader must constantly review, select and apply changing technological tools with respect to the goals of the organization in which they will be used. Leadership is required of the educational technologist in the implementation of these responsibilities. The goal of the APTEC specialization is to prepare the student as a child and youth advocate in the use of educational technology.

TWO DELIVERY SYSTEMS: CLUSTER AND NATIONAL

Almost one-half of Nova's 12,000 students are in field-based programs. These programs are delivered in a variety of ways, ranging from regional locations where students meet once a month for an all-day Saturday class with a professor flown to the particular location by Nova, to the student working at home using a personal computer and modem to communicate electronically over regular phone lines. A historical summary and description of several of these electronically delivered programs is provided in Appendix A.

The CYS program utilizes both the cluster delivery system and the National Cluster format, which uses a combination of the cluster approach as well as electronically delivered interaction. Students in this format meet twice a year for a 3 to 5-day period to interact with the professor responsible for a specific study area. During the following 3-4 months, students and faculty interact through the use of audiobridge, video and audiotapes, electronic mail, and Electronic Classroom (ecr). The latter is a program developed by Nova that utilizes the unix system, providing an electronic forum in which teacher and students interact simultaneously. Two-thirds of the screen is allotted to the teacher to display previously prepared material, or to enter questions and comments in real time. One-third of the screen displays the names of students who have logged into the class. The use of that portion of the screen is given to a student when "called on" by the teacher.

APTEC COURSES

Students in all specializations of the CYS doctoral program take their core courses throughout the year and their specialization courses during the summer. Normally, there are four specialization courses, two of which are offered each summer. However, students in the APTEC specialization complete three technology

courses, in each of two years of study (see Appendix B for the full course descriptions). These courses are listed below:

YEAR 1

EDUT 8001:	Integrating Educational Technology in Curriculum Design and Evaluation (3 credits)
EDUT 8001:	Application of Technology to Education, Training and Instructional Management (2 credits)
CED 8486:	Implementing Emerging Technologies in Programs for Children and Youth I (2 credits)

YEAR 2

EDUT 8003:	Managing Educational Technology Programs (3 credits)
EDUT 8004:	Human Resources: Issues and Research in Educational Technology (2 credits)
CED 8487:	Implementing Technologies in Programs for Children and Youth II (2 credits)

MULTIMEDIA APPROACH

A variety of approaches and/or strategies are important in the provision of appropriate education to a society that is increasingly multicultural. Traditional methods (e.g., chalk/talk, listen/learn) need to yield to teaching strategies that address the whole student. New strategies must deal with students' abilities to learn visually and tactically as well as to mentally process information. More importantly, these approaches must challenge the student not just to absorb information, but to use their powers of higher-order thinking to inquire, to research, and to problem solve in the search for their own solutions and answers. Technology can have an important impact through the use of simulation programs, through access to a broad variety of databases that can provide textual and visual information, and by securing information and-or-informed opinions of others using conferencing capabilities of telecommunications. It is, therefore, most appropriate that those who are involved with education, training, and instructional management through the use of technology be thoroughly immersed in the application potentials of today's available software and hardware.

EVALUATION

Four distinct clusters of students (two field-based groups and two national groups) are included in the evaluation which encompasses the three year span of the program. All participants are currently enrolled students in the Ed.D. Program in Child and Youth Studies. The purpose of the evaluation is to determine the extent to which a high tech delivery system is effective in providing program services to doctoral students. The method for this project is based on Stufflebeam's CIPP Model. Attention has been directed to the process and product phases of the model focusing on the issue of program effectiveness. Evaluation data is being collected in an ongoing manner using multiple measures (e.g., student learning styles, attrition rate, faculty/student evaluations) as currently exists within the CYS Program. Student outcomes including assignment grades, final grades, and exam grades are also being monitored.

In the course of this evaluation, three separate studies are being conducted using discrete outcome variables as additional criteria for evaluating the program. One of these studies involves the use of a pre/post achievement test designed by project staff. The research design used for this particular study will be quasi-experimental as the groups are already intact thereby allowing no random assignment.

PROJECTIONS FOR FUTURE MEDIA USE

The use of computers, audio and videotapes, and the mailing of computer disks seem to be most appropriate for the delivery of distance instruction into the home today; however, we anticipate changes in the near future. As a result, we see an increased emphasis on the following projects:

- **COMPUTER ASSISTED INSTRUCTION (CAI) Packages**
  In the immediate future, CAI programs will be provided on disk in an MS-DOS format and later in the MAC format. Eventually, similar lessons will be provided online for easier access and revision. These CAI programs will be used to increase the amount of instructionaL time provided to students; some programs will be provided for enrichment activities. We are currently beginning this project in the area of Research and Evaluation study area, in which students indicate they need the most support.

- **Videotapes**
  The use of videotapes will be further expanded so tapes are available in all curricular areas. The approach used in these tapes will be increasingly interactive; students must perform various activities during

the viewing of the tapes and as follow-up activities. Online conferences may be planned to follow up the viewing of selected tapes.

- **Audiobridge Use**
  Although very expensive, the audiobridge is currently being used in the Human Development study area. Its use will be expanded to the Research and Evaluation area, but for shorter periods of time by combining it with the use of the less expensive, computerized, ecr sessions.

- **CD-ROM**
  We will become more involved in the production of CD-ROM discs or their successor so that students can enjoy full multimedia CAI in their homes as part of their degree work.

- **Multimedia Workstations**
  As emerging technologies become more affordable, we will incorporate their use into the program. When costs are lower, direct home access will be more feasible than it is today. We also anticipate the development of lower-cost, multimedia workstations in the home connected by optical fiber for full two-way video and audio connections to supplement the data exchanges we enjoy today.

CONCLUSION

Those who have an above-normal interest in the use of technology and are professional educators or providers of information to children and youth have an opportunity to focus a significant portion of their doctoral program on the use of high technology to improve the learning process. The APTEC specialization makes available a doctoral program that can be taken by working professionals and that provides an emphasis on the use of technology for the improvement of learning. The results of the first year of the evaluative study indicate that the online version of the CYS program has been successful. This suggests that the graduate students within this doctoral program will be better prepared leaders for tomorrow and they will be able to make use of technology in their work to better meet the needs and interests of children and youth.

Through the availability of the National Cluster, even those students geographically isolated will be able to actively engage in the program through their home telephone lines and computers. As our communication models continue to become more sophisticated, it is comforting to know that graduates of the APTEC program will be equipped to take immediate advantage of new hardware and software as it becomes available.

APPENDIX A - DESCRIPTION OF FIELD-BASED PROGRAMS

John Scigliano
Vice President for Computer and Information Technology
Nova University

Nova University has offered distance learning programs since 1972 when it started the Educational Leaders Ed.D. program and the Ed.D. Program for Community College Faculty. Both of these programs were designed to serve the needs of practitioners and were offered in a field-based "cluster" format in over thirty states. Eleven years later in August of 1983 Nova began a the Doctor of Arts in Information Science (D.A.I.S) program for information professionals in schools and higher education settings. The D.A.I.S program was designed to be delivered online through telecommunications and personal computers. This was in the days when the CP/M operating system was popular and each of the students used a portable microcomputer with a modem to access the campus mainframe from their homes. Students were located in all 50 states. Also in 1983, the Director of the Masters in Childcare Administration (MCCA) program, equipped 5 students with Commodore 64 computers to conduct their instruction online. Beginning with less than a dozen students in late 1983 and early 1984, the first groups began their graduate work online with quarterly weekend meetings at cluster locations around the country or in week-long intensive sessions in January and July.

Other programs soon followed as the computer-based distance delivery system proved popular with working adults. In 1984, a doctoral program in computer education began along with a similar program in computer-based training. Nova targeted several more disciplines for graduate programs where the computer was used as a base of work. Graduate programs in information systems, computer science, and information resources were started during this time period. Academic centers within Nova began adopting computer-based methods to deliver components of their programs. These included the School of Business that required all of its D.B.A. students to have personal computers and use them for completing assignments in research and statistics. The School of Business requires its doctoral students to take a four-part three-credit research course online over a two-year period. Thus, many students are now taking advantage of the online distance delivery option. The rest of the graduate education students are exposed to this use of technology and online communications as part of the technology training they receive in their more traditional program.

In 1989, the Center for the Advancement of Education at Nova began to incorporate many of these online delivery techniques into their weekend cluster programs that had been offered since early in 1972. Today, this center has four groups (clusters) of "national students" in the Child and Youth Studies (CYS) doctoral program and an initial group of 10 students in an online "Multi-Tech" approach to the

coursework required in the Higher Education doctoral program. Plans are underway to begin such an option in the Childcare Administration masters program within the next two years.

Today, the online delivery system has expanded to include a wide range of doctoral and masters offerings with some 3000 graduate and undergraduate students involved. Graduates have been highly successful in using the knowledge they gained during their programs of study and have applied these online techniques to their own work environments. Nova University has continued to explore other emerging technologies, including multimedia techniques, to enhance learning.

Audio, Video, and Computer Technologies:

The use of video and audio cassettes to enhance and help prepare for online discussions is becoming more important each year. The University uses the Unix Operating system (Digital's Ultrix) on its host computer (named "Novavax") and provides a number of programs to assist the learner with online work. Computer conferencing, the Electronic Classroom, the Electronic Library, the Internet, CAI systems, Writers' Workbench, SPSS-X and many other programs are among those available to students online. In addition to electronic mail (email), Nova developed a unique interactive program called the Electronic Classroom (ECR) to emulate a traditional classroom online. Up to 58 students can meet at a prearranged time in one of the 32 or more online classrooms. The instructor has the major portion of the screen and students get a four-line window for communication. Students may ask questions, make comments, etc. that may be seen by all of the participants in the "classroom" setting. Several journal articles and conference presentations have been given describing the ECR.

Another resource for Nova's online students is the Electronic Library (EL). The university library catalog can be accessed online and requests made for books and articles to be sent to the students. An information specialist conducts electronic literature searches on topics of special interest and need. The Electronic Library menu also connects the student to supplementary services to enable each student to complete individual, online searches of the ERIC database, order books and articles, or access online library catalogs around the world.

Even those students who are not enrolled in the electronic delivery mode benefit from the advances that Nova has made in the delivery of distance education. Instructors can share the experiences they have had with distance education students in their technology orientation classes. Thus, many Nova graduates become familiar with the concept of distance education as it has been delivered via the online environment. For example, one of Nova's graduate education programs, delivered in

a cluster format, within the State of Florida, is using an audio bridge to conduct lectures for students.

Because Nova University has been a leader in distance education since 1972, and it has built a reputation for bringing graduate programs to learners in ways that are not place or time dependent, students and professors at Nova have been on the cutting-edge of the application of technology to learning for over two decades. As formats and approaches have been found that work well, rigorous, practical academic programs have been developed that have attracted thousands of students. The graduates of these programs lead and/or teach in major school systems, universities and colleges, and work in businesses and various agencies.

The Commission on Colleges of the Southern Association of Schools and Colleges recognized Nova's leadership and invited its representatives to join a special committee to help develop the criteria and procedures for visiting accreditation teams to use when visiting institutions offering distance education for their students.

Nova currently edits or sponsors two traditional professional journals. In addition, two faculty members from Nova University are joining the current editor of the *Chronicle of Distance Education and Communication* (University of Alaska at Juneau) to co-edit the online (via Internet) Chronicle and to enlarge its scope. There is a readership of some 2,000 subscribers with another 2,000 secondary readers on supplemental networks. In May, 1993 Nova will assume responsibility for editing the online journal of adult education (*New Horizons*) that was previously hosted by Syracuse University. Thus, through conference presentations, articles, and journal editing, in addition to being one of the world's largest schools of graduate education programs, Nova is heavily involved in the dissemination of information on distance education.

APPENDIX B - APTEC COURSE DESCRIPTIONS

YEAR 1

EDUT 8001: INTEGRATING EDUCATIONAL TECHNOLOGY IN CURRICULUM DESIGN AND EVALUATION (3 CREDITS)

Students review historical foundations, evolution, and impact of technology on curriculum design and evaluation, and analyze and assess Instructional Design (ID) models in light of their relationship to individual learning styles. Available software and hardware are used in the creation of an instructional design model appropriate to the individual student's work setting.

EDUT 8001: APPLICATION OF TECHNOLOGY TO EDUCATION, TRAINING AND INSTRUCTIONAL MANAGEMENT (2 CREDITS)

The focus is on the development of technical competencies, with an emphasis on the application of telecommunications and online resources to the development of professional networks. hardware and software evaluation criteria is also stressed.

CED 8486: IMPLEMENTING EMERGING TECHNOLOGIES IN PROGRAMS FOR CHILDREN AND YOUTH I (2 CREDITS)

This course focuses on the direct application of the emerging technologies and telecommunications to education, training and instructional management programs. Students demonstrate technological competence by completing tasks appropriate to their skill levels.

YEAR 2

EDUT 8003: MANAGING EDUCATIONAL TECHNOLOGY PROGRAMS (3 CREDITS)

Students synthesize the current management literature relating to educational technology, addressing such topics as needs analysis, organizational structure, strategic planning, identification and allocation of resources, networking, dissemination of technological information and skills, and copyright laws. Political issues governing licensing practices, fiscal responsibilities, and the future of educational technology in public and private education, community programs, and distance education are explored.

EDUT 8004: HUMAN RESOURCES: ISSUES AND RESEARCH IN EDUCATIONAL TECHNOLOGY (2 CREDITS)

Issues relevant to human resources professionals concerned with the application of technology to education, training and instructional management are investigated. Students analyze the impact of such factors as interpersonal communication strategies, cross-cultural understandings, sexism and racism, and equitable access to technology by disadvantaged and handicapped populations. Staff development practices, personnel support systems, evaluation procedures, and leadership skills are considered.

CED 8487: IMPLEMENTING TECHNOLOGIES IN PROGRAMS FOR CHILDREN AND YOUTH II (2 CREDITS)

Advanced study in the implementation of educational technology is provided through direct application opportunities. These activities include the use of current emerging technologies in programs for children and youth, as well as an opportunity to apply and evaluate the effectiveness of these technologies in their own work environments.